



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
NORTHEAST REGION
One Blackburn Drive
Gloucester, MA 01930

Mr. Richard R. Hoffman
Leader, Gas Group 2
Office of Energy Projects
Federal Energy Regulatory Commission
Washington, DC 20426

SEP 14 2001

Dear Mr. Hoffman:

Enclosed is the National Marine Fisheries Service's (NMFS) biological opinion on the impacts of the Federal Energy Regulatory Commission's (FERC) issuance of a permit for the proposed dredging and pipelaying project during the construction of the Millennium Pipeline Project on endangered shortnose sturgeon. This biological opinion was prepared pursuant to the inter-agency consultation requirements of Section 7 of the Endangered Species Act.

Based on our review of the FERC's Biological Assessment, the Millennium Pipeline Project Supplemental Draft Environmental Impact Statement, and available scientific information, NMFS concludes that pipeline construction conducted from September 1 to November 15 in Haverstraw Bay in the Hudson River, may adversely affect, but is not likely to jeopardize the continued existence of listed species under NMFS' jurisdiction.

The enclosed biological opinion provides an Incidental Take Statement (ITS) for endangered shortnose sturgeon, as well as reasonable and prudent measures and terms and conditions necessary for the FERC to minimize impacts to the species. The ITS authorizes the take of one (1) shortnose sturgeon from injury or mortality for the Millennium Pipeline Project conducted from September 1 to November 15. However, an unknown amount of non-lethal incidental take (i.e. harass) may result from the large amount of inwater activity and it is difficult to predict how many sturgeon may be displaced and/or disrupted. The assignment of a number is highly speculative and in instances such as these, the NMFS designates the expected level of take from harassment for the pipeline project as unquantifiable.

The NMFS expects the FERC to implement the reasonable and prudent measures and terms and conditions as outlined in the ITS. The measures of the ITS are non-discretionary and must be undertaken by the FERC for the incidental take exemption to apply.



This biological opinion concludes consultation for the proposed dredging and pipelaying project during the construction of the Millennium Pipeline Project. Reinitiation of this consultation is required if: (1) the amount or extent of taking specified in the ITS is exceeded; (2) new information reveals effects of these actions that may affect listed species or critical habitat in a manner or to an extent not previously considered; (3) project activities are subsequently modified in a manner that causes an effect to the listed species that was not considered in this biological opinion; or (4) a new species is listed or critical habitat designated that may be affected by the identified actions. As identified in the biological opinion, NMFS Northeast Regional staff should be contacted immediately if an interaction with a shortnose sturgeon occurs.

For further information regarding any consultation requirements, please contact Mary Colligan, Assistant Regional Administrator for Protected Resources, NMFS Northeast Regional Office, at (978) 281-9116.

I look forward to continued cooperation with the FERC during future Section 7 consultations.

Sincerely,

A handwritten signature in blue ink, appearing to read "Patricia A. Kurkul", is written over a light blue rectangular stamp.

Patricia A. Kurkul
Regional Administrator

Enclosure

cc: FERC - Jeff Shenot
GCNE - MacDonald
F/NER3 - Anthony
F/NER4 - Colosi


File Code: 1514-05 (A) FERC - Millennium Pipeline Project

National Marine Fisheries Service
Endangered Species Act - Section 7 Consultation
Biological Opinion

Action Agency: Federal Energy Regulatory Commission

Activity: Initiation of Consultation on the Millennium Pipeline Project

Conducted by: National Marine Fisheries Service, Northeast Region

Approved by: 

Date Issued: 9/14/01

This is the National Marine Fisheries Service's (NMFS) biological opinion on the effects of the Federal Energy Regulatory Commission's (FERC) issuance of a permit for the proposed dredging and pipelaying project during the construction of the Millennium Pipeline Project on threatened and endangered species in accordance with section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 et seq.).

This biological opinion is based on information provided in the January 2001 Biological Assessment (BA) prepared by the FERC. In addition to the BA, the FERC provided the March 2001 Supplemental Draft Environmental Impact Statement (SDEIS) on the Millennium Pipeline Project.

Consultation History

The proposed project involves constructing a pipeline that would traverse Haverstraw Bay on the Hudson River, New York. Dredging a trench and laying pipe are the main construction activities associated with this project.

On January 17, 2001, the FERC submitted a BA and requested initiation of formal consultation on the Millennium Pipeline Project based on the determination that the proposed project may effect and result in "take" of shortnose sturgeon (*Acipenser brevirostrum*). The NMFS reviewed the BA and concluded that additional information would be necessary before the formal consultation process could proceed. On April 4, 2001, the NMFS requested additional information to supplement the BA. The information requested by the NMFS was discussed in greater detail during a conference call with the FERC on May 18, 2001.

Additional information was submitted by the FERC in a letter dated June 1, 2001. On June 7, 2001, the applicant, Millennium Pipeline Company, visited the NMFS Northeast Regional Office and presented information on their project application. This did not represent any new information from the NMFS' perspective, but rather provided

additional clarification and details on project components. As a result, June 1, 2001, was determined to be the date of initiation of formal consultation.

On June 15, 2001, the NMFS informed the FERC that all of the information necessary for a formal section 7, consultation and the preparation of a biological opinion had been received and reminded the FERC not to make any irreversible or irretrievable commitment of resources that would prevent the NMFS from proposing or the FERC from implementing any reasonable and prudent alternatives to avoid jeopardizing shortnose sturgeon. The ESA and section 7 regulations require that formal consultation be concluded within 90 calendar days of initiation, and the biological opinion be delivered to the action agency within 45 days after the conclusion of formal consultation.

While the FERC is the lead agency, the Army Corps of Engineers (ACOE) is also a cooperating Federal agency due to their involvement with the dredging portion of this project. The ACOE has assisted the FERC with the production of the Environmental Impact Statement on the Millennium Pipeline Project.

Description of the Proposed Action

Millennium Pipeline Company (Millennium) has proposed to construct 417.3 miles of new natural gas pipeline and appurtenant facilities to transport natural gas from the United States (U.S.)/Canadian border in Lake Erie to an interconnection with Consolidated Edison Corporation (ConEd) in Mount Vernon, New York. Millennium has proposed to cross the Hudson River in Haverstraw Bay between Bowline Point in Haverstraw, New York and Cortlandt, New York, a crossing of about 2.1 miles.

Millennium proposes to use an open-cut lay-barge dredge method to excavate trench sections and lay pipeline across Haverstraw Bay. An open-cut lay-barge dredge method would limit the amount of open trench to about 1300 feet at any one time. Construction activities associated with this method include excavating trench sections 150 feet in width by 1,300 feet in length, temporarily storing the excavated material in barges, continuously welding and laying pipe on a moving lay-barge, and backfilling the trench using bottom dump barges as soon as each section of the pipe is laid. This operation would continue sequentially for 2.1 miles across Haverstraw Bay. Millennium has proposed to use a closed bucket for all dredging activities; in shallow water a 6 cubic-yard bucket would be used and in deep water a 22-cubic-yard bucket. The depth of the trench is estimated to be 20 feet, with a trench bottom width of 10 feet, and a trench side slope of 3 to 1 for installation in the shipping channel.

A proposed portion of the Millennium Pipeline Project would cross the Hudson River at Haverstraw Bay. The total area that may be affected by dredging activities was calculated using models of the lay-barge construction method. Through the use of models, estimates were made about the extent of the visible plume and the thickness of sediment

deposition that would result from dredging and backfilling operations. During dredging operations in shallow and deep water, modeling predicted a visible plume ranging between 60 and 90 feet wide by between 35 and 460 feet long, and a plume ranging between 90 and 500 feet wide by between 170 and 400 feet long during backfilling in shallow water. Based upon these estimates, the total area impacted on any given day would range between 0.06 acre and 5.23 acres. For about 30 minutes twice a day during backfilling operations in deep water using a bottom dump barge, approximately 9.18 acres would be affected.

All construction activities must be completed September 1 through November 15. However, the BA states that construction of each 1300 ft trench section would take 2 weeks to complete and the length of the crossing is 2.1 miles (11,088 feet). Based upon these values the construction time needed for completion would be at approximately 17 weeks. On June 7, 2001, in a meeting with the applicant, the NMFS raised the issue of the discrepancy over the prescribed work window and the actual construction time. Millennium stated that trench sections would be completed using a rolling construction method so each trench section would not take a full 2 weeks to complete, but rather as the back end of the barge finished construction of one section, the front of the barge would be working on constructing a new trench section. The result of which would be completion of all construction activities within the designated work window. However, Millennium stated that if during the course of the project, it appears that construction will not be able to completed within the designated work window of September 1 through November 15, they do have a contingency plan. If the contingency plan allows dredging outside the window of September 1 to November 15 such a project modification would require reinitiation of consultation. Dredging during the winter may pose additional risk to shortnose sturgeon as they tend to be less mobile while overwintering.

Action Area

The action area is defined in 50 CFR 402.02 as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." The total area impacted by dredging and backfilling operations consists of approximately 108.5 acres extending from Haverstraw, New York to Cortlandt, New York. Any individual (i.e. spawning adults, non-spawning adults, juveniles) in the Hudson River population of shortnose sturgeon has the potential to be in the project area, however, direct and indirect impacts should not extend beyond dredging operations. Therefore, the action area for this biological opinion is the area identified for dredging.

Status of Species or Critical Habitat

The only endangered or threatened species under NMFS' jurisdiction in the action area is the endangered shortnose sturgeon (*A. brevirostrum*). No critical habitat has been designated for shortnose sturgeon.

Status of Shortnose Sturgeon Rangewide

At hatching, shortnose sturgeon are blackish-colored, 7-11 mm long and resemble tadpoles (Buckley and Kynard 1981). In 9-12 days, the yolk sac is absorbed and the sturgeon develops into larvae, which are about 15 mm total length (TL) (Buckley and Kynard 1981). Sturgeon larvae are believed to begin down-stream migrations at about 20 mm TL. Laboratory studies suggest that young sturgeon move downstream in a 2-step migration: a 2-day migration by larvae followed by a residency period by young of the year, then a resumption of migration by yearlings in the second summer of life (Kynard 1997). At the larval stage, sturgeon are believed to be even more benthic than the adults. They are rarely found in the water column and possibly spend the majority of their time in interstitial spaces in the gravel (Pottle and Dadswell, 1979). Juvenile shortnose sturgeon (3-10 year olds) reside in the interface between saltwater and freshwater in most rivers (NMFS 1998).

Shortnose sturgeon have similar lengths at maturity (45-55 cm fork length) throughout their range, but, because sturgeon in southern rivers grow faster than those in northern rivers, southern sturgeon mature at younger ages (Dadswell et al. 1984). Shortnose sturgeon reach sexual maturity between approximately 6 and 10 years of age. Based on limited data, females spawn every three to five years while males spawn every two years. The spawning period is estimated to last from a few days to several weeks. Spawning begins from late winter/early spring (southern rivers) to mid to late spring (northern rivers) when the freshwater temperatures increase to 8-9° C.

In populations that have free access to the total length of a river (e.g., no dams within the species' range in a river: Saint John, Kennebec, Altamaha, Savannah, Delaware and Merrimack Rivers), spawning areas are located at the farthest upstream reach of the river (NMFS 1998). Sturgeon spawn in upper, freshwater areas and feed and overwinter in both fresh and saline habitats. Shortnose sturgeon spawning migrations are characterized by rapid, directed and often extensive upstream movement (NMFS 1998). Shortnose sturgeon typically leave the spawning grounds soon after spawning. Non-spawning movements include rapid, directed post-spawning movements to downstream feeding areas in spring and localized, wandering movements in summer and winter (Dadswell et al. 1984; Buckley and Kynard 1985; O'Herron et al. 1993). Kieffer and Kynard (1993) reported that post-spawning migrations were correlated with increasing spring water temperature and river discharge.

Juvenile shortnose sturgeon generally move upstream in spring and summer and move back downstream in fall and winter; however, these movements usually occur in the region above the saltwater/freshwater interface (Dadswell et al. 1984; Hall et al. 1991). The species appears to be estuarine anadromous in the southern part of its range, but in some northern rivers, it is "freshwater amphidromous" (i.e., adults spawn in freshwater but regularly enter saltwater habitats during their life; Kieffer and Kynard 1993). Adult sturgeon occurring

in freshwater or freshwater/tidal reaches of rivers in summer and winter often occupy only a few short reaches of the total length (Buckley and Kynard 1985). Summer concentration areas in southern rivers are cool, deep, thermal refugia, where adult and juvenile shortnose sturgeon congregate (Flournoy et al. 1992; Rogers and Weber 1994; Rogers and Weber 1995; Weber 1996). While shortnose sturgeon are occasionally collected near the mouths of rivers, they are not known to participate in coastal migrations (Dadswell et al. 1984).

Shortnose sturgeon are benthic omnivores but have also been observed feeding off plant surfaces (Dadswell et al. 1984). Generally, shortnose sturgeon feed on crustaceans, insect larvae, worms and molluscs (NMFS 1998). Feeding patterns vary seasonally between northern and southern river systems.

Shortnose sturgeon were listed as endangered on March 11, 1967 (32 FR 4001). Shortnose sturgeon remained on the endangered species list with enactment of the ESA in 1973. A shortnose sturgeon recovery plan was published in December 1998, to promote the conservation and recovery of the species.

Although the shortnose sturgeon was originally listed as endangered rangewide, in the final recovery plan NMFS recognized 19 separate distinct populations occurring in New Brunswick, Canada (1); Maine (2); Massachusetts (1); Connecticut (1); New York (1); New Jersey/Delaware (1); Maryland/Virginia (1); North Carolina (1); South Carolina (4); Georgia (4); and Florida (2). In the plan, NMFS stated that loss of a single shortnose sturgeon population segment may risk the permanent loss of unique genetic information that is critical to the survival and recovery of the species and that, therefore, each shortnose sturgeon population should be managed as a Distinct Population Segment (DPS) or recovery unit for the purposes of section 7 of the ESA. Under this policy, actions that could adversely affect a DPS or recovery unit would be evaluated in terms of their potential to jeopardize the continued existence of an individual population segment (as opposed to the existence of shortnose sturgeon rangewide).

The Shortnose Sturgeon Recovery Plan (NMFS 1998) identifies habitat degradation or loss (resulting, for example, from dams, bridge construction, channel dredging, and pollutant discharges) and mortality (resulting, for example, from impingement on cooling water intake screens, dredging and incidental capture in other fisheries) as principal threats to the species' survival. The recovery goal is identified as delisting shortnose sturgeon populations throughout their range and the recovery objective is to ensure that a minimum population size is provided such that genetic diversity is maintained and extinction is avoided.

Status of Shortnose Sturgeon in the Hudson River

Shortnose sturgeon were first observed in the Hudson River by early settlers who captured them as a source of food and documented their abundance (Bain et al. 1998). Shortnose sturgeon in the Hudson River

were documented as abundant in the late 1880's (Ryder 1888 in Hoff 1988). Prior to 1937 a few fisherman were still commercially harvesting shortnose sturgeon in the Hudson River, however, fishing pressure declined as the population decreased. Water pollution, over fishing, and the commercial Atlantic sturgeon fishery are all factors that may have contributed to the decline of shortnose sturgeon in the Hudson River (Hoff 1988). The NMFS' goal for shortnose sturgeon in the Hudson River is to recover the population to a level that would support reclassifying this sturgeon from endangered to threatened and eventually removing them from the federal list of threatened and endangered species.

In the 1930's the New York State Biological Survey launched the first scientific analysis that documented the distribution, age, and size of mature shortnose sturgeon in the Hudson River (Bain et al. 1998). In the 1970's scientific sampling resumed precipitated by the lack of biological data and concerns about the impact of electric generation facilities on fishery resources (Bain et al. 1998). The current population of shortnose sturgeon has been documented by tagging studies conducted throughout the entire range of shortnose sturgeon in the Hudson River.

From 1993 through 1997, researchers at Cornell University (Bain et al. 1998) completed the most recent population estimate of shortnose sturgeon in the Hudson River. Utilizing targeted and dispersed sampling methods, 6,430 adult shortnose sturgeon were captured and 5,959 were marked. Of the group of adults captured and marked, 269 were the result of recapture. Based upon the population sampled, the total population of shortnose sturgeon in the Hudson River is estimated to be 61,057. This estimate includes adults and an estimated 4,439 juveniles. Based upon size structure analysis of the sampling results, juveniles make up approximately 3% of the of the total population. Although fish populations dominated by adults are not common for most species, there is no evidence that this is atypical for shortnose sturgeon (Bain et al. 1998). This study provides the best information available on the current status of the Hudson River population and suggests that all findings indicate the population is relatively healthy, large, and particular in habitat use and migratory behavior (Bain et al. 1998).

Shortnose sturgeon occur in the Hudson River from approximately New York City to the Troy Dam (Rkm 248). From late fall to early spring, adult shortnose sturgeon concentrate in a few overwintering areas. Reproductive activity the following spring determines overwintering behavior, spawning adults concentrate near Kingston (Rkm 140) while one group of non-spawning adults concentrates near Kingston and the other near Haverstraw Bay (Rkm 54-61) (Buckley and Kynard 1985; Dovel et al. 1992; Bain et al. 1998). Tagging studies by Geoghehan (1992) provide additional earlier data confirming the presence of mature adults in the Kingston and Haverstraw Bay regions. Typically movements during overwintering periods are localized and fairly sedentary. In mid-April reproductively active adults begin their

migration upstream to the spawning grounds that extend from below the Federal Dam at Troy to about Cossackie (Rkm 239-190) (Bain et al. 1998). Mature males usually spawn at approximately 3-4 years of age feeding sporadically prior to migration, while females do not feed at all prior to spawning and reach maturity at approximately 6-8 years of age (Bain et al. 1998). Spawning occurs from late April through May, after which they disperse down river into their summer range. The broad summer range occupied by adult shortnose sturgeon extends from approximately Rkm 38 to Rkm 122 (NMFS 1998).

Shortnose sturgeon eggs adhere to solid objects on the river bottom for approximately 10 to 15 days until the larvae hatch (Bain et al. 1998). The Hudson River population of shortnose sturgeon larvae generally range in size from 15 to 18 mm TL at hatching (Bain et al. 1998). Larvae gradually disperse downstream after hatching, occupying most of the Hudson River Estuary and are most commonly found in deep waters with strong currents (Bain et al. 1998; Dovel et al. 1992). The transition from the larval to juvenile stage generally occurs around approximately 2 cm TL and is marked by fully developed external characteristics (Bain et al. 1998).

Similar to non-spawning adults, most juveniles occupy the broad region of Haverstraw Bay (Rkm 55-63) (Dovel et al. 1992; Geoghegan et al. 1992) by late fall and early winter. Juveniles are distributed throughout the mid-river region during the summer and move back into the Haverstraw Bay region during the late fall (Bain et al. 1998; Geoghegan et al. 1992; Haley 1998).

The difference in prey preference among shortnose sturgeon is dependent upon life stage (NMFS 1998). Molluscs are the preferred prey among adult populations range wide (NMFS 1998). Adults have been found to be more selective feeders than juveniles, however, both are continuous feeders (Dadswell 1979).

Environmental Baseline

By regulation, environmental baselines for biological opinions include the past and present impacts of all State, Federal or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation in process (50 CFR 402.02). The environmental baseline for this biological opinion includes the effects of several activities that affect the survival and recovery of threatened and endangered species in the action area.

Dredging

The construction and maintenance of Federal navigation channels and other maintenance dredging projects have been identified as a source of sturgeon mortality. The Hudson River Federal Navigation Channel is maintained by the ACOE. Maintenance dredging began September 10, 1987 and was completed October 10, 1987. Bottom material lying above the

plane of 32 feet below mean low water was removed in specified areas of Haverstraw Bay. A clamshell dredge was used and 346,706 cubic yards of material was removed during 1987 maintenance dredging. The ACOE has also issued a permit authorizing the applicant, U.S. Gypsum, to perform maintenance dredging. The U.S. Gypsum Company is located on the Hudson River at Stony Pointe, Rockland County, New York. Maintenance dredging has been performed by U.S. Gypsum periodically to reestablish adequate water depth for safe navigation in U.S. Gypsums' berthing area. Most recently, in a letter dated August 30, 2000, the ACOE requested concurrence from the NMFS that maintenance dredging proposed by U.S. Gypsum would not be likely to adversely affect species protected by the ESA and that project construction would have minimal adverse affect on Essential Fish Habitat. On September 25, 2000, the NMFS concurred, provided that the final permit would include all of the conditions previously negotiated. U.S. Gypsum proposes to use a clamshell bucket with barge overflow for dredging and removal of approximately 107,040 cubic yards of material from an area approximately 650,000 square feet in size. The dredged material will be disposed by bottom-opening barges at the Historic Area Remediation Site (HARS). In an effort to minimize impacts to shortnose sturgeon, dredging activity is restricted to September through mid-November. Despite seasonal restrictions, dredging may cause shortnose sturgeon displacement, injury and/or mortality, as well as affect foraging and migration behavior.

Since dredging requires the removal of material from the bottom of the bay down to a specified depth, it causes severe disruption to the benthic community. Disruption of the benthos may affect shortnose sturgeon foraging and migration behavior given that they are benthic omnivores. Dredging has also been known to cause temporary displacement, injury and/or mortality, which may also affect the ability of the Hudson River DPS or recovery unit to recover.

Atlantic sturgeon were killed in the Cape Fear River in a bucket and barge operation (NMFS 1998). This example is outside of the action area, however, it demonstrates that bucket and barge operations do have the potential to harm shortnose sturgeon.

Contaminants and Water Quality

Contaminants including heavy metals, polychlorinated aromatic hydrocarbons (PAHs), pesticides, and polychlorinated biphenyls (PCBs), can have serious deleterious effects on aquatic life and are associated with the production of acute lesions, growth retardation, and reproductive impairment (Ruelle and Keenlyne 1993). Contaminants introduced into the water column or through the food chain, eventually become associated with the benthos where bottom dwelling species like shortnose sturgeon are particularly vulnerable.

Several characteristics of shortnose sturgeon life history including long life span, extended residence in estuarine habitats, and being a benthic omnivore, predispose this species to long term repeated exposure to environmental contaminants and bioaccumulation of

toxicants (Dadswell 1979). In the Connecticut River, coal tar leachate was suspected of impairing sturgeon reproductive success. Kocan (1993) conducted a laboratory study to investigate the survival of sturgeon eggs and larvae exposed to PAHs, a by-product of coal distillation. Only approximately 5% of sturgeon embryos and larvae survived after 18 days of exposure to Connecticut River coal-tar (i.e., PAH) demonstrating that contaminated sediment is toxic to shortnose sturgeon embryos and larvae under laboratory exposure conditions (NMFS 1998).

Although there is scant information available on the levels of contaminants in shortnose sturgeon tissues, some research on other related species indicates that concern about the effects of contaminants on the health of sturgeon populations is warranted. Detectible levels of chlordane, DDE (1,1-dichloro-2, 2-bis(p-chlorophenyl)ethylene), DDT (dichlorodiphenyl-trichloroethane), and dieldrin, and elevated levels of PCBs, cadmium, mercury, and selenium were found in pallid sturgeon tissue from the Missouri River (Ruelle and Henry 1994). These compounds were found in high enough levels to suggest they may be causing reproductive failure and/or increased physiological stress (Ruelle and Henry 1994). In addition to compiling data on contaminant levels, Ruelle and Henry also determined that heavy metals and organochlorine compounds (i.e. PCBs) accumulate in fat tissues. Although the long term effects of the accumulation of contaminants in fat tissues is not yet known, some speculate that lipophilic toxins could be transferred to eggs and potentially inhibit egg viability. PCB's may also contribute to a decreased immunity to fin rot. In other fish species, reproductive impairment, reduced egg viability, and reduced survival of larval fish are associated with elevated levels of environmental contaminants including chlorinated hydrocarbons. A strong correlation that has been made between fish weight, fish fork length, and DDE concentration in pallid sturgeon livers indicates that DDE increases proportionally with fish size (NMFS 1998).

Point source discharge (i.e., municipal wastewater, paper mill effluent, industrial or power plant cooling water or waste water) and compounds associated with discharges (i.e., metals, dioxins, dissolved solids, phenols, and hydrocarbons) contribute to poor water quality and may also impact the health of sturgeon populations. The compounds associated with discharges can alter the pH of receiving waters, which may lead to mortality, changes in fish behavior, deformations, and reduced egg production and survival.

Millennium conducted sediment sampling in the action area and found contaminants including arsenic, barium, cadmium, chromium, lead, mercury, and silver. Although no PCBs have been detected in the action area, it is possible that they are present given Haverstraw Bay receives discharge from upriver areas known to have high levels.

Scientific Studies

The Hudson River population of shortnose sturgeon have been the focus of a prolonged history of scientific research. In the 1930's the New York State Biological Survey launched the first scientific sampling study and documented the distribution, age, and size of mature shortnose sturgeon (Bain et al. 1998). In approximately 1965, research resumed in response to a lack of biological data and concerns about the impact of electric generation facilities on fishery resources (Hoff 1988). In an effort to monitor relative abundance, population status, and distribution, intensive sampling of shortnose sturgeon in this region has continued throughout the past forty years. Sampling studies targeting other species may have also incidentally captured shortnose sturgeon. As a result of techniques associated with these sampling studies, shortnose sturgeon have been subjected to capturing, handling, and tagging. It is possible that research in the action area may have influenced and/or altered the migration patterns, reproductive success, foraging behavior, and survival of shortnose sturgeon.

Fisheries

Unauthorized take of shortnose sturgeon is prohibited by the ESA. However, shortnose sturgeon are taken incidentally in other anadromous fisheries along the East coast and may be targeted by poachers (NMFS 1998). In the Hudson River, American shad, river herring, and blue crab are the target of commercial fishing operations (Kahnley 2001, pers. comm.) Seasonal restrictions apply to the American shad and river herring gillnet fisheries that operate in the spring (Kahnley 2001, pers. comm.). In Haverstraw Bay, recreational fisherman target a number of species such as bluefish, weakfish and white codfish. The incidental take of shortnose sturgeon on the Hudson River has been documented in both commercial shad fisheries as well as recreational hook and line fisheries.

Effects of the Proposed Action

This section of a biological opinion assesses the direct and indirect effects of the proposed action on threatened and endangered species or critical habitat, together with the effects of other activities that are interrelated or interdependent (50 CFR 402.02). Indirect effects are those that are caused later in time, but are still reasonably certain to occur. Interrelated actions are those that are part of a larger action and depend upon the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration (50 CFR 402.02).

The purpose of this assessment is to determine if it is reasonable to expect that the FERC's proposed action will have direct or indirect effects on threatened and endangered species that will appreciably reduce their likelihood of both survival and recovery in the wild by reducing the reproduction, numbers, or distribution of that species [which is the "jeopardy" standard established by 50 CFR 402.02].

It is important to assess the impacts of the proposed project on shortnose sturgeon that have the potential to be in the action area during construction of the pipeline. As previously mentioned, from late fall to early spring, adult shortnose sturgeon overwinter in dense aggregations. Reproductive activity the following spring determines overwintering behavior; non-spawning adults aggregate in and/or near Haverstraw Bay (Rkm 54-61) while spawning adults concentrate near Kingston (Rkm 140) (Buckley and Kynard 1985, Dovel et al. 1992, Bain et al. 1998). Similar to non-spawning adults, most juveniles occupy the broad region of Haverstraw Bay by late fall and early winter (Rkm 55-63) (Dovel et al. 1992, Geoghegan et al. 1992). Although the seasonal construction window will reduce impacts, shortnose sturgeon may still be present in the action area and could potentially be directly and indirectly affected by dredging and pipelaying operations. Dredging may directly result in mortality and/or injury to shortnose sturgeon. Dredging operations may also indirectly impact shortnose sturgeon by altering foraging behavior, disrupting spawning migrations, destroying benthic feeding areas, and causing displacement. Both direct and indirect impacts should be considered when determining the effect of dredging and pipelaying operations on the survival and recovery of shortnose sturgeon in the Hudson River.

Shortnose sturgeon are benthic omnivores. This makes them particularly susceptible to dredging which involves the removal of bottom material. The most eminent danger for shortnose sturgeon during dredging is entrapment or entrainment in the dredge equipment. Incidental takes of shortnose sturgeon have been documented during other dredging operations. In mid-March, 1996, during dredging of the Federal navigation channel in the Delaware River, three sub-adult shortnose sturgeon were found in a dredge discharge pool on Money Island, near Newbold Island. The dead sturgeon were found on the side of the spill area into which the hydraulic pipeline dredge was pumping, and the large amounts of roe would infer the fish were alive and in good condition prior to entrainment. In January, 1998, three shortnose sturgeon were discovered in the hydraulic maintenance dredge spoil in the Florence to Trenton section of the upper Delaware River. The only visible physical damage to two of the shortnose sturgeon was damage around the gill plate, while the other fish had physical damage to the stomach area. Hopper dredges have also been documented to entrain sturgeon. In the Cape Fear River, Atlantic sturgeon were killed in both hydraulic pipeline and bucket and barge operations (NMFS 1998). While these instances were not in the Hudson River, the potential for shortnose sturgeon to be taken in dredging operations in the Hudson River is equally possible, if not more so because the Hudson River population of shortnose sturgeon is relatively large.

Millennium has proposed to use a closed bucket dredge during pipeline construction in Haverstraw Bay. Incidental take of shortnose sturgeon in closed bucket dredging operations may not be as high as those for hopper or hydraulic pipeline, but the possibility remains observed by the take of Atlantic sturgeon in the Cape Fear River. It is possible

shortnose sturgeon could be injured or killed from entrapment in the bucket during the removal of material from the bottom. Shortnose sturgeon accidentally captured and/or emptied onto the backfill barge, if not instantly killed, may still suffer severe stress or injury which could also lead to mortality. Once the pipeline has been installed, a bottom dump barge will be used to backfill trench sections. Shortnose sturgeon could also become buried during backfill operations, leading to injury and/or mortality.

Dredging operations can cause indirect impacts to shortnose sturgeon in the action area. The most notable indirect impact is the destruction of the benthic habitat and prey resources. Shortnose sturgeon generally feed when water temperature exceeds 10°C and in general, foraging is heavy immediately after spawning in the spring and during the summer and fall, with lighter foraging during the winter (NMFS 1998). Shortnose sturgeon are benthic omnivores but have also been observed feeding off plant surfaces (Dadswell et al. 1984). As previously mentioned the difference in prey preference among shortnose sturgeon is dependent upon life stage. Juveniles have been found to have a high incidence of non-food items in their stomach in contrast to adults, who seem to be more selective feeders (Dadswell et al. 1984). However, both are continuous feeders (Dadswell 1979).

Information on preferred prey items and habitat use of shortnose sturgeon in the Hudson River is limited, however, some data does exist. Carlson and Simpson (1987) examined the food habits of juvenile shortnose sturgeon impinged on power plant intake screens in the Hudson River Estuary. For all sizes of shortnose sturgeon collected, midge larvae and amphipods were the most important food items, occurring in 76% of all stomachs sampled. Midge larvae contributed 51% of all organisms found and amphipods 43% (Carlson and Simpson 1987). Yearling and juvenile sturgeon were found to have consumed the amphipods *Gammarus* spp. and the isopod *Cyathura*. The increased use of amphipods as food items appears to be in response to their peak abundance during the late summer (Carlson and Simpson 1987). Preferred foraging grounds for shortnose sturgeon in the Hudson were found to be sandy-mud bottom (Carlson and Simpson 1987). Observations in other river systems support these results (Dadswell 1979; Pottle and Dadswell 1979; Dadswell 1984).

Only recently have new techniques allowed gut contents to be sampled without sacrificing the fish (Haley 1998). Using a gastric lavage technique, the gut contents of sturgeon in the Hudson River were sampled (Haley 1998). Between June and September 1996, the gastric lavage method was used to sample the gut contents of 48 shortnose sturgeon and 23 Atlantic sturgeon. No deaths or injuries were observed throughout the entire sampling process. Two of the 48 sturgeon sampled were juveniles. Identifiable prey were recovered from 39 out of the 48 sturgeon. Based upon the results of this sampling effort, preferred food items of shortnose sturgeon in the Hudson Estuary include: amphipods *Gammarus*, chironomids, isopods *Cyathura polita*, zebra mussels, and snails.

Shortnose sturgeon use Haverstraw Bay as an important foraging ground throughout the summer and into the fall. Given that dredging will likely destroy all prey resources in the action area, shortnose sturgeon foraging habitat will be reduced. In other utility crossings, post-monitoring data demonstrate the benthic habitat sustained damage for up to ten years following construction (Iraquios Gas Pipeline, Post-construction Monitoring 1992). While these post-monitoring data are valuable, it can not be used to predict the recovery of the benthic habitat in the action area because of variables (i.e. substrate type, construction method) that influence the recovery rate of the benthic community (Volk 2001, pers. comm.). Recovery rate is also influenced by the life history of the organisms present in disrupted areas. Some of the primary organisms targeted by shortnose sturgeon are epi-benthic (i.e. amphipods, midge larvae) (Simpson et al. 1984). Given Haverstraw Bay is tidal, it is possible that epi-benthic species may be pushed by tidal forces back into areas previously disturbed, resulting in more rapid recovery (Volk 2001, pers. comm.; Bain 2001, pers. comm.). In addition to relatively rapid recovery of certain species, sturgeon have extensive foraging habitat outside the action area. Thus, the temporary reduction in foraging habitat should not greatly affect shortnose sturgeon (Bain 2001, pers. comm.).

Numerous studies have assessed the impact of turbidity/suspended sediment on fish. While not all of the studies have focused exclusively on shortnose sturgeon, the results demonstrate that suspended sediment may have an adverse impact on fish. Elevated levels of suspended sediment can cause displacement, disruption of spawning migrations and foraging behavior, and mortality. The suspended sediment concentration (SSC) in estuarine environments is particularly influenced by: tidal flow and river discharge (Collins 1995). Haverstraw Bay is tidal and experiences a significant amount of freshwater input from the upper reaches of the Hudson River. Sediments in the Bay can generally be characterized as silty/clay-like material which may stay in suspension longer than other types of sediments.

Backfilling, and bucket impact, penetration, and withdrawal, are the major factors that contribute to SSC (Collins 1995). Given Millennium proposes to use a closed bucket dredge, sediment loss during withdrawal would be reduced. Burton specifically investigated the effects of bucket dredging on suspended sediment (Burton 1993). In an effort to evaluate water quality standards set by the Delaware River Basin Commission (DRBC), Burton monitored the water quality before, during, and after bucket dredging operations in the Delaware River. Thirteen observations out of 10,500, exceeded water quality standards. Burton concluded that the effects of bucket dredging during the summer are limited, however, he acknowledged that this staggered schedule effectively mitigated the cumulative effects of multiple operations working in an area and suggested it may be prudent to limit the number of concurrent dredging operations.

Research conducted on other species indicates that certain levels of SSC's may be lethal and/or inhibit normal behavior. In extreme cases, exposure to high concentrations have resulted in adult fish kills due to sediment saturation of the gills (Muncy et al. 1979 in Burton 1993). Lethal limits are difficult to determine because they vary widely among species. Sherk (1975) conducted research on toxic levels of SSC's and found species tolerance ranged from 580 mg/l to 24,500 mg/l. Sherk also suggested that substantial alterations of striped bass movement as a result of high turbidity was unlikely because striped bass are prolific in estuaries which are fairly turbid environments (Sherk et al. 1975). Surveys conducted by Radtke and Turner (1967) found that SSC's as low as 350 mg/l blocked upstream migrations. Vineyard and O'Brien (1976) found reduced activity among largemouth bass and green sunfish exposed to turbidity levels of 14-16 nephelometric units (NTUs) (4.5 mg/l) (Heimstra et al. 1969 in Burton 1993).

While these results demonstrate that suspended sediment may have an adverse impact on other fish species, observations made during maintenance dredging in the Delaware River indicate adult sturgeon seem to be able to withstand some degree of suspended sediments given they frequently are found in turbid waters (Hastings 1983). It is unclear at what level suspended sediment begins to affect sturgeon behavior. Spawning migrations may be disrupted, however, it is not likely that such concentrations will completely inhibit migratory behavior. Given construction of the pipeline will occur in 1300 ft sections across the river, shortnose sturgeon should still be able to use migration corridors on either side of dredging/pipelaying operations. While recruitment during the construction season should not significantly be affected non-migrating adults may be temporarily displaced.

Several studies have also examined the effects of turbidity on larvae. Observations in the Delaware River indicate that larval populations may be decimated when suspended material resettles out of the water column (Hastings 1983). Larval survival studies conducted by Auld and Schubel (1978) showed that striped bass larvae tolerated 50 mg/l and 100 mg/l suspended sediment and that survival was significantly reduced at 1000 mg/l. In the BA, Millennium has stated that total suspended solids (TSS) were predicted not to exceed 1000 mg/l above ambient conditions within 30 feet of trenching. However, the 401 Water Quality Certificate Conditions for the proposed portion of the Millennium Pipeline Project state suspended solids are not to exceed 25 mg/l over background at 25m (75 ft) from dredging operations when ambient levels are lower than 100 mg/l, and turbidity is not to exceed ambient levels by more than 30% at 25m (75 ft) from operation. The NMFS recognizes that New York State Department of Environmental Conservation (DEC) certifies that the Millennium Pipeline Project will not contravene effluent limitations or standards as provided by the Clean Water Act of 1977 provided that all conditions of the 401 Certificate are met.

In the Hudson River, larvae gradually disperse downstream after

hatching, occupying most of the Hudson River Estuary and are most commonly found in deep channels with strong currents. Given the proposed project will traverse deep channel areas, some larval mortality may occur.

High concentrations of suspended sediments also lead to reduced dissolved oxygen concentrations, which result when organic material in sediment is released back into the water column stimulating oxygen consuming bacteria (Burton 1993). Jenkins found that juvenile shortnose sturgeon experienced relatively high mortality (86%) when exposed to dissolved oxygen concentrations of 2.5 mg/l (NMFS 1998). Older sturgeon (>100 days) could tolerate dissolved oxygen concentrations of 2.5 mg/l with < 20% mortality, indicating an increased tolerance for lowered oxygen level by older fish (NMFS 1998). If the proposed dredging operations lead to similar lethal levels, sturgeon may be forced to move to other areas of the Bay.

The resuspension of contaminated sediments may pose a threat to shortnose sturgeon present in the action area. Sturgeon are particularly susceptible to repeated long term exposure due to their extended life span. Millennium conducted sediment sampling on the sediments within the action area and found arsenic, barium, cadmium, chromium, lead, mercury, and silver. Additional sediment samples will be required at different locations along the crossing to test for PCB's which are known to be present in Haverstraw Bay. Although shortnose sturgeon in the action area may experience a temporary increase in bioaccumulation, exposure will not be long term and should not affect sturgeon health.

In general, the excessive amounts of underwater noise and/or activity associated with dredging could also disrupt the normal distribution or abundance of the species in the action area. If adult or juvenile shortnose sturgeon were in the vicinity of the project area during dredging, pipelaying, and backfilling operations, their foraging patterns and/or normal distribution may be disrupted. Any anthropogenic deterrence of endangered species from an area is considered harm (and thus take) under the ESA. The NMFS defines the term harm as an act which actually kills or injures fish and wildlife and includes significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns such as breeding, feeding, sheltering, migrating, spawning or rearing. However, the number of sturgeon potentially displaced by the pipeline construction is unknown, as a large number of adults and juveniles have not been documented in the action area.

Cumulative Effects

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur within the action area considered in the biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to

section 7 of the ESA.

Contaminants and Water Quality

Contaminants found in the action area could be linked to some industrial development along the waterfront. Heavy metals, and waste associated with point source discharges are likely to be present in the future due to continued operation of industrial facilities. In addition, many contaminants such as PCBs remain present in the environment for prolonged periods of time and would not disappear even if contaminant inputs were to decrease. It is likely that shortnose sturgeon will continue to be affected by contaminants in the action area in the future.

Some industrialized waterfront development will continue to impact the water quality in and around the action area. Three power plants (i.e. Bowline, Roseton, and Lovett) are present in the vicinity of the action area and are likely to continue to operate. Excessive water turbidity and water temperature variations are likely with continued future operation of these facilities. As a result, shortnose sturgeon spawning, foraging and/or distribution in the action area may be impacted.

Scientific Studies

It is likely that additional scientific studies will be conducted on shortnose sturgeon in the action area. Continued capturing, handling, tagging, and tracking of shortnose sturgeon may affect their migration, reproduction, foraging, and survival.

Fisheries

Incidental take of shortnose sturgeon has been documented in both commercial and recreational fisheries in the Hudson River (NMFS 1998). The potential for incidental take to occur in the future is likely when fisheries are known to occur in the presence of shortnose sturgeon. Thus, the operation of these recreational and commercial fisheries in the action area could result in shortnose sturgeon injury and/or mortality.

Integration and Synthesis of Effects

The shortnose sturgeon is endangered throughout its entire range. It exists as 19 separate DPS that should be managed as such; specifically, the extinction of a single shortnose sturgeon population risks permanent loss of unique genetic information that is critical to the survival and recovery of the species. The Hudson River shortnose sturgeon form one of the 19 distinct sturgeon populations.

Shortnose sturgeon in the action area may be adversely affected by the Millennium Pipeline Project. Adult shortnose sturgeon are known to be present in the broad region from Haverstraw Bay to Kingston throughout the fall and winter, however, the abundance within the action area itself is unknown. As a result, although adult shortnose sturgeon do not concentrate in large aggregations in the action area, there is the potential that some adults may be in the area during dredging and

pipelaying operations and could be adversely affected.

Juvenile shortnose sturgeon may also be in the action area during dredging and pipelaying operations. Similar to non-spawning adults, most juveniles are distributed throughout the mid-river region during the summer and move back into the broad region of Haverstraw Bay by late fall (Bain et al. 1998; Geoghegan et al 1992; Dovel et al. 1992). Unlike most other species, the juvenile population only accounts for 3% of the total population, however, there is no evidence that this is atypical for shortnose sturgeon (Bain et al. 1998). Based upon this information, it is quite possible that they may be present in the action area and thus could be adversely affected by dredging and pipelaying.

The presence of adults and/or juveniles in the action area during dredging and pipelaying could result in direct injury and/or mortality. Incidental take of sturgeon has been documented during other dredging operations involving hopper, hydraulic, and bucket dredges. Shortnose sturgeon potentially could be injured or killed from entrapment in the bucket or burial in sediment during both dredging and backfilling operations. Shortnose sturgeon accidentally captured and/or emptied onto the backfill barge may also suffer severe stress or injury which could also lead to mortality.

Dredging can also result in indirect effects to shortnose sturgeon by elevating levels of suspended sediment, thus altering and/or limiting distribution. Elevated levels of suspended sediments could lead to a reduction in dissolved oxygen and resuspension of contaminants, resulting in temporarily increased levels of bioaccumulation and altered distribution. Dredging will also cause the destruction of the benthic habitat and prey resources, thus altering and/or limiting foraging patterns and distribution. In general, underwater noise associated with substantial amounts of in water work may deter shortnose sturgeon from the action area. If juvenile and adult shortnose sturgeon are in the action area, their distribution, health, and foraging habitat may be affected by activities associated with the dredging and pipelaying.

Based on the time of year the project is to be completed, the apparent low density of shortnose sturgeon in the action area, and the type of dredge equipment being employed, NMFS believes that the incidental take of shortnose sturgeon will be minimal. Considering the environmental baseline, the effects of the proposed action, and future cumulative effects in the action area, the proposed project is not likely to reduce the reproduction, numbers, and distribution of the Hudson River DPS in a way that appreciably reduces their likelihood of survival and recovery in the wild.

Conclusion

After reviewing the current status of the species discussed herein, the environmental baseline for the action area, the effects of the proposed action and the cumulative effects, it is the NMFS' biological

opinion that the proposed action may adversely affect but is not likely to jeopardize the continued existence of the Hudson River subpopulation of shortnose sturgeon. No critical habitat has been designated for this species, therefore, none will be affected.

Incidental Take Statement

Section 9 of the ESA and Federal regulations pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined to include any act which actually kills or injures fish or wildlife and includes significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns such as breeding, feeding, spawning, rearing, migrating, or sheltering. Harass is defined as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited under the ESA provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary, and must be undertaken by the FERC so that they become binding conditions for the exemption in section 7(o)(2) to apply. The FERC has a continuing duty to regulate the activity covered by this Incidental Take Statement. If the FERC (1) fails to assume and implement the terms and conditions or (2) fails to adhere to the terms and conditions of the Incidental Take Statement through enforceable terms, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the FERC must report the progress of the action and its impact on the species to the NMFS as specified in the Incidental Take Statement [50 CFR §402.14(i)(3)].

NMFS anticipates that the Millennium Pipeline Project conducted from September 1 to November 15 may result in the observed take of (1) shortnose sturgeon from injury or mortality. However, an unknown amount of non-lethal incidental take (i.e. harass) may result from the large amount of inwater activity and it is difficult to predict how many sturgeon may be displaced and/or disrupted. The assignment of a number is highly speculative and in instances such as these, the NMFS designates the expected level of take from harassment for the pipeline project as unquantifiable.

The NMFS believes this level of incidental take is reasonable given (1) the distribution and abundance of adult shortnose sturgeon in the immediate project area; (2) the distribution and abundance of

juveniles in the immediate project area; (3) the time of year proposed for the project; and (4) the type of dredge equipment being employed. Consultation must be reinitiated if the take level is exceeded.

In the accompanying biological opinion, the NMFS determined that this level of anticipated take is not likely to result in jeopardy to the species.

Reasonable and prudent measures

The NMFS believes the following reasonable and prudent measures are necessary and appropriate to minimize impacts of incidental take of endangered shortnose sturgeon:

1. The FERC must have NMFS-approved observers onboard the dredge and backfill barge to record interactions with shortnose sturgeon during dredging, pipelaying, and backfilling.
2. The FERC must develop and follow a system to provide timely reporting to the NMFS on any takes of protected species.
3. The FERC must employ the use of silt curtains during backfilling operations to minimize levels of suspended sediment.

Terms and conditions

In order to be exempt from prohibitions of section 9 of the ESA, the FERC must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline required reporting/monitoring requirements. These terms and conditions are non-discretionary.

Trained NMFS-approved observers must be present on the dredge and backfill barge for the duration of the project (September 1 to November 15).

2. If any whole shortnose sturgeon (alive or dead) or sturgeon parts are taken incidental to the project, Carrie McDaniel (978)281-9388 or Mary Colligan (978)281-9116 must be contacted within 24 hours of the take. An incident report for shortnose sturgeon take (Appendix A) should also be completed by the observer and sent to Carrie McDaniel via FAX(978)281-9394 within 24 hours of the take. Every incidental take (alive or dead) should be photographed and measured, if possible.
3. Silt curtains should be bottom weighted and run surface to bottom around the area being backfilled in order to effectively minimize suspended sediment concentrations.

Conservation Recommendations

Section 7(a)(1) of the ESA directs Federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency

activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. NMFS has determined that the proposed portion of the Millennium Pipeline Project is not likely to jeopardize the continued existence of endangered shortnose sturgeon located in the project area. To further reduce the adverse effects of the pipeline project on listed species, NMFS recommends that the FERC implement the following conservation measures.

1. To facilitate future management decisions on listed species occurring in the action area, the FERC should maintain a database mapping system to : 1) create a history of use of the geographic areas affected; and, 2) document endangered/threatened species presence/interactions with project operations.
2. The FERC should support biological monitoring before and after pipeline construction to evaluate the response of the benthic community to disturbance and monitor the recovery rate of the benthic community. The data could be used as a baseline for evaluating the recovery of other benthic communities after disturbances such as other utility crossings, dredging, or blasting.
3. The FERC should support monitoring of shortnose sturgeon habitat use prior to and following benthic disruption. This data would be invaluable in evaluating the response of shortnose sturgeon to habitat disruption.
4. The FERC should support monitoring of dissolved oxygen levels during dredging to further evaluate the effects of dredging activities on water quality standards.

Reinitiation of Consultation

This concludes formal consultation on the actions outlined in the BA and SEIS for the Millennium Pipeline Project. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of taking specified in the incidental take statement is exceeded; (2) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered; (3) the identified action is subsequently modified in a manner that causes an effect to listed species or critical habitat that was not considered in this biological opinion; or (4) a new species is listed or critical habitat designated that may be affected by the identified action. In instances where the amount or extent of incidental take is exceeded, section 7 consultation must be reinitiated immediately.

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APPENDIX A.

Incident Report of Shortnose Sturgeon Take
Millennium Pipeline Project

Species _____ Date _____ Time (specimen found) _____

Geographic Site _____
Location: Lat/Long _____
Vessel Name _____ Load # _____

Sampling method _____
Location where specimen recovered _____

Condition of equipment where specimen recovered _____

Weather conditions _____

Water temp: Surface _____ Below midwater (if known) _____

Species Information: (please designate cm/m or inches.)

Total length: _____ Fork length: _____ Weight: _____
Condition of fish/description of animal _____

Fish tagged: YES / NO / DON'T KNOW
Please record all tag numbers. Tag # _____

Photograph attached: YES / NO
(please label species, date, and geographic site on back of photograph)

Comments/other _____

Observer's Name _____
Observer's Signature _____